UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/00343 (LAA)
2003/01068 (NLAA)

November 10, 2003

Mickey Carter
KEC-4
Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208-3621

Re: Endangered Species Act Section 7 Formal and Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Wanaket Wildlife Area Management Plan, Columbia River, Umatilla County, Oregon

Dear Mr. Carter:

Enclosed is a document prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of funding the proposed Wanaket Wildlife Area Management Plan, along the Columbia River, Umatilla County, Oregon, on ESA-listed Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*), Snake River (SR) steelhead, Upper Columbia River (UCR) steelhead, SR spring/summer chinook salmon (*O. tshawytscha*), SR fall chinook salmon, UCR spring chinook salmon, SR sockeye salmon (*O. nerka*) (hereinafter collectively referred to as "ESA-listed anadromous salmonids") and designated critical habitat. The document contains both concurrence on activities which may affect, but are not likely to adversely affect (NLAA) (refer to: 2003/01068) ESA-listed anadromous salmonids, and a biological opinion (Opinion) for those activities which may affect, but are likely to adversely affect (LAA) (refer to: 2003/00343) ESA-listed anadromous salmonids. In this Opinion, NOAA Fisheries concludes that the proposed LAA actions are not likely to jeopardize the continued existence of ESA-listed anadromous salmonids. As required by section 7 of the ESA, NOAA Fisheries includes reasonable and prudent measures with nondiscretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the impact of incidental take associated with this action.

This document also contains a consultation on essential fish habitat (EFH) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and its implementing regulations (50 CFR Part 600). NOAA Fisheries concludes that the proposed action may adversely affect designated EFH for chinook salmon. As required by section

305(b)(4)(A) of the MSA, included are conservation recommendations that NOAA Fisheries believes will avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from the proposed action. As described in the enclosed consultation, 305(b)(4)(B) of the MSA requires that a Federal action agency must provide a detailed response in writing within 30 days of receiving an EFH conservation recommendation.

If you have any questions regarding this letter, please contact Brett Farman of my staff in the Oregon Habitat Branch at 541.975.1835, ext 228.

Sincerely,

For Michael R Crouse

D. Robert Lohn
Regional Administrator

cc: Eric Quaempts, CTUIR
John Kinney, USFWS
Tim Bailey, ODFW

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Wanaket Wildlife Area Management Plan,
Columbia River,
Umatilla County, Oregon

Agency:	Bonneville Power Administration
Consultation Conducted By:	National Marine Fisheries Service, Northwest Region
Date Issued:	November 10, 2003
Issued by:	for Michael R Crouse D. Robert Lohn Regional Administrator
Refer to:	**2003/00343 (LAA)** **2003/01068 (NLAA)**

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1. INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with the National Marine Fisheries Service (NOAA Fisheries) and U.S. Fish and Wildlife Service (together "Services"), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitats. This biological opinion (Opinion) is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations 50 CFR 402.

The analysis also fulfills the essential fish habitat (EFH) requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (section 305(b)(2)).

The Bonneville Power Administration (BPA) proposes to fund the management of the Wanaket Wildlife Area (WWA). The WWA management plan (Management Plan) will be implemented by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). The Management Plan is designed to protect or enhance fish and wildlife habitat in the Columbia River basin. The administrative record for this consultation is on file at the NOAA Fisheries Oregon Habitat Branch office in Portland, Oregon.

1.1 Background and Consultation History

On April 3, 2003, the National Marine Fisheries Service (NOAA Fisheries) received a biological assessment (BA) from the BPA, and a written request for concurrence with a finding that the proposed action is "not likely to adversely affect" (NLAA) Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*), Snake River (SR) steelhead, Upper Columbia River (UCR) steelhead, SR spring/summer chinook salmon (*O. tshawytscha*), SR fall chinook salmon, UCR spring chinook salmon, SR sockeye salmon (*O. nerka*) (hereinafter collectively referred to as "ESA-listed anadromous salmonids") or any designated critical habitat within the project area. The listing status and history for species addressed in this Opinion are summarized in Table 1.

Table 1. References for Additional Background on Listing Status/Critical Habitat/Protective Regulations/and Biological Information for the Listed Species Addressed in this Opinion.

Species	**Listing Status**	**Critical habitat**	**Protective Regulations**	**Biological Information/ Population Trends**
SR fall-run chinook salmon	Threatened 04/22/92 57 FR 14653	12/28/93 58 FR 68543	07/22/1992 57 FR 14653	Waples *et al.* 1991c; Healey 1991; ODFW and WDFW 1998
SR spring/summer-run chinook salmon	Threatened 04/22/92 57 FR 14653	12/28/93 58 FR 68543 and 10/25/19 64 FR 57399	04/22/1992 57 FR 14653	Matthews and Waples 1991; Healey 1991; ODFW and WDFW 1998
UCR spring-run chinook salmon	Endangered 03/24/99 64 FR 14308	N/A	ESA prohibition on take applies	Myers *et al.*1998; Healey 1991; ODFW and WDFW 1998
SR sockeye salmon	11/20/91 56 FR 58619 Endangered	12/28/93 58 FR 68543	ESA prohibition on take applies	Waples *et al.* 1991b; Burgner 1991; ODFW and WDFW 1998
UCR steelhead	08/18/97 62 FR 43937 Endangered	N/A	ESA prohibition on take applies	Busby *et al.* 1995; Busby *et al.* 1996; ODFW and WDFW 1998
SR Basin steelhead	08/18/97 62 FR 43937 Threatened	N/A	07/10/00 65 FR 42423	Busby *et al.* 1995; Busby *et al.* 1996; ODFW and WDFW 1998
MCR steelhead	03/25/99 64 FR 14517 Threatened	N/A	07/10/00 65 FR 42422	Busby *et al.* 1995; Busby *et al.* 1996; ODFW and WDFW 1998

NOAA Fisheries reviewed the information, and was concerned about irrigation screens which did not meet NOAA Fisheries Juvenile Fish Screen Criteria (NOAA Fisheries 1996a). After discussions with BPA, CTUIR, and NOAA Fisheries Hydropower Division staff, it was determined that screen replacement would be necessary. On May 27, 2003, NOAA Fisheries issued a letter of nonconcurrence to the BPA and requested additional information for the WWA management plan.

On July 31, 2003, the National Marine Fisheries Service (NOAA Fisheries) received a letter and project information from the BPA requesting consultation regarding the potential effects of the proposed irrigation screen replacement and update to the WWA Management Plan in Umatilla County, Oregon on ESA-listed anadromous salmonids or any designated critical habitat within the project area. The accompanying biological assessment (BA) described proposed screen replacement, the revised WWA Management Plan, and the potential effects of those actions on ESA-listed anadromous salmonids and their designated critical habitat in the Columbia River. Consultation was initiated upon receipt of the letter and attached project information.

The proposed action will likely affect tribal trust resources. Because the action is likely to affect tribal trust resources, NOAA Fisheries has contacted CTUIR pursuant to the Secretarial Order (June 5, 1997). The CTUIR has indicated that the proposed Project will benefit tribal trust resources, and therefore, the CTUIR is supportive of the Project.[1]

1.2 Proposed Action

Proposed actions are defined in the Services' consultation regulations (50 CFR 402.02) as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." Additionally, U.S. Code (16 U.S.C. 1855(b)(2)) further defines a Federal action as "any action authorized, funded, or undertaken or proposed to be authorized, funded, or undertaken by a Federal agency." Because the BPA proposes to fund the action that may affect listed resources, it must consult under ESA section 7(a)(2) and MSA section 305(b)(2).

The proposed WWA Management Plan is an update of the original plan which was completed in 1995. The Management Plan includes activities such as prescribed burning, herbicide control, grass seeding, shrub and forb planting, refuge area establishment, habitat additions, waterfowl and upland bird hunting, plant gathering, hiking/viewing/interpretation, canal maintenance, vector control, noxious weed control, fence and sign maintenance, waste disposal, law enforcement, and fire protection within the WWA. The BA requests concurrence that the 17 above-mentioned actions are NLAA ESA-listed anadromous salmonids or their designated critical habitat. In addition to the 17 actions listed above, the plan proposes to continue irrigating potholes to maintain wetlands. The existing pump screens do not meet NOAA Fisheries' Juvenile Fish Screen Criteria (screen criteria) (NOAA Fisheries 1996a). To comply with the screen criteria, the BPA proposes to fund the replacement of screens to meet screen criteria by March of 2004. The CTUIR has indicated that some irrigation may continue during the interim period before screen replacement. The BPA has indicated that the interim operation of the irrigation pumps and the upgrading of the fish screen components of these pumps are LAA ESA-listed anadromous salmonids or their designated critical habitat. The area consists primarily of sagebrush dominated shrub/steppe habitats and emergent wetlands that occur in small closed basins known as "the McNary Potholes." The BPA is funding the CTUIR to manage the WWA as compensation for habitat lost as a result of the construction of McNary Hydroelectric Facility.

The WWA management plan proposes to implement the use of herbicides and biological agents to control undesirable vegetation and mosquitos. The herbicides Round-up® and Oust® will be applied in the WWA via all-terrain vehicle (ATV) and backpack mounted sprayers to control undesirable vegetation. Herbicide treatments will not occur within 0.25 miles of the Columbia River, and the WWA does not have any tributaries or return irrigation flow which flows back into the Columbia River. Herbacides will not be applied when winds are in excess of 5 miles per

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[1] Personal communication with Eric Quaempts (CTUIR), August 2003.

hour. The biological agents proposed for mosquito control are *Bacillus thuringiensis isrealensis* (*Bti*) and *Bacillus sphaericus* (*Bs*). Both agents are normally occurring soil bacteria and are expected to be specific agents against mosquito larva, blackfly larva, and fungus gnat larva. Biological agents will be applied by spraying aerially as well as by ground using backpack and ATV sprayers. Biological agents will not be applied within 0.75 miles of the Columbia River, and spraying will not occur when winds exceed 5 miles per hour.

This project includes prescribed burning as regular maintenance along canals as well as a one time prescribed burn in the WWA. For the one time prescribed burn, burning would occur in October and be limited to 60 acres of a retired feedlot to reduce cover of foxtail barley, Russian thistle, and tumble mustard. The feedlot is in "BoxCanyon" and is bounded on two sides by rock cliffs that reach as high as 30 feet. The cliffs effectively form fire lines, and there is no need for pre-burn line construction because the feedlot is bordered by a road. Immediately before ignition, a pumper-truck with water would be used to wetline approximately 800 to 1,000 feet of the feedlot that is not bounded by a road or a cliff. The cliffs and roads form the fire break for the remainder of the prescribed burn area. The feedlot area is flat, has no drainages, and is 1/3 mile from the Columbia River. The regular canal maintenance burns would include burning dead and weedy vegetation along canal berms. Burning may occur in either spring or fall, and water would be used to extinguish flames to eliminate fire spread beyond the base of the berm. There is no return flow from canals back into the Columbia River or tributaries.

Road obliteration is limited to seeding roadbeds and closing them to use. Because of the sandy soils, no actual physical manipulation of roadbeds with heavy equipment is planned. Roads are seeded with a perennial bunchgrass mixture including Sandberg's bluegrass (*Poa secunda*), Indian ricegrass (*Oryzopsis hymenoides*), and bluebunch wheatgrass (*Agropyron spicatum*).

The BPA requested concurrence on the 17 categories of Management Plan actions which the BPA has indicated are NLAA ESA-listed anadromous salmonids or their designated critical habitat. The plan will be effective through the 2006 fiscal year (ending October 1, 2007). This document serves as concurrence on those actions which are NLAA ESA-listed anadromous salmonids or their designated critical habitat and provides incidental take coverage for actions which are LAA ESA-listed anadromous salmonids or their designated critical habitat. Actions which are deemed LAA ESA-listed anadromous salmonids or which would adversely modify their designated critical habitat are analyzed in detail in this Opinion.

Based on information provided by BPA, NOAA Fisheries concurs with the determination that the 17 actions (prescribed burning, herbicide control, grass seeding, shrub and forb planting, refuge area establishment, habitat additions, waterfowl and upland bird hunting, plant gathering, hiking/viewing/interpretation, canal maintenance, vector control, noxious weed control, fence and sign maintenance, waste disposal, law enforcement, and fire protection) within the WWA are NLAA ESA-listed salmonids or their designated critical habitat. Table 2 displays the activities considered in this Opinion along with their determination of effect and brief rationale for that determination.

Table 2. Effects Determination Summary for action in the WWA

Activity	**Effects Determination**	**Rationale**
Prescribed Burning	NLAA	Light fuels, no return flow to Columbia River.
Herbicide Control	NLAA	Ground application, 0.25 miles from Columbia River, only applied when winds less than 5 mph.
Grass Seeding	NLAA	No known adverse effects.
Shrub and Forb Planting	NLAA	No known adverse effects.
Refuge Area Establishment	NLAA	No known adverse effects.
Habitat Additions	NLAA	No additional water withdrawals or known adverse effects.
Waterfowl and Upland Bird Hunting	NLAA	Use of anything but non-toxic shot is prohibited, camping and boat use are prohibited.
Plant Gathering	NLAA	No known adverse effects.
Hiking/Viewing/Interpretation	NLAA	Motorized vehicles prohibited.
Canal Maintenance	NLAA	No maintenance within 0.25 miles of Columbia River, no return flow to Columbia River.
Vector Control	NLAA	Biological control specific to mosquitos, fungus gnat larva, and blackflies, no treatment within 0.75 miles of Columbia River, no application when winds exceed 5mph.
Noxious Weed Control	NLAA	Ground based application, no application within 0.25 miles of Columbia River, no application when winds exceed 5mph.
Fence Maintenance	NLAA	No known adverse effects.
Sign Maintenance	NLAA	No known adverse effects.
Waste Disposal	NLAA	Waste disposal off site.
Law Enforcement	NLAA	No known adverse effects.
Fire Protection	NLAA	Funding mechanism only, no known adverse effects.
Interim Irrigation Pump Operation	LAA	Screens do not currently meet NOAA Fisheries Juvenile Screen Criteria.[2]
Irrigation Pump Screen Replacement	LAA	In-water work with potential for juveniles to be present.

[2] Upon compliance with NOAA Fisheries Juvenile Screen Criteria, irrigation pump operation will be NLAA ESA-listed anadromous salmonids.

Therefore, the above-listed 17 NLAA actions are not reasonably certain to cause incidental take of ESA-listed anadromous salmonids or adversely modify designated critical habitat.

The BPA must reinitiate consultation on the 17 NLAA actions if: (1) New information reveals that effects of the action may affect listed species in a way not previously considered; (2) the action is modified in a way that causes an effect on listed species that was not previously considered; or (3) a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

The irrigation component of the WWA management plan is LAA ESA-listed anadromous salmonids or their designated critical habitat and is considered further in this document. The management plan proposes continued pumping of water from the Columbia River, starting during the spring and continuing as needed through the fall, to irrigate the "McNary Potholes." The BA indicates that pumping is allowed by two Certificates of Water Rights and associated permits. Typically, pumping begins in early March and continues through April 15th. Pumping resumes when needed from May 15th through October 31st. The pump screens do not currently meet NOAA Fisheries' 1996 Juvenile Fish Screen Criteria for Pump Intakes (screen criteria) (NOAA Fisheries 1996a) for screen opening size. The current screens are not baffled for uniform approach velocity and therefore, the approach velocity for the WWA screen is unknown. The WWA screen operate in water that will fluctuate from 3 to 10 feet deep (1 to 3 times the screen criteria depth). Because the current screens' approach velocities are unknown, the screen mesh openings are too large, and the screens are not self cleaning, BPA has determined that juvenile ESA-listed anadromous salmonids may be injured or killed by operating the pumps with the current screens.

To reduce the risk of injury or death of ESA-listed anadromous salmonids while operating pumps with the current screens, CTUIR has incorporated conservation measures for pump operations until March 31, 2004. The CTUIR has indicated that pumping will cease when the Lake Wallula/McNary pool drops to a level which the screens are less than two screen radii below the surface (approximately 6 feet underwater). Juvenile ESA-listed anadromous salmonids typically prefer shallow water for predator avoidance, therefore, using the depth of the screens during operation as a determining factor, the WWA can reduce the likelihood that juveniles would be in the immediate vicinity of the screen. Screens would be inspected every two weeks to ensure that debris accumulation or screen damage are not contributing to increased approach velocities or entrainment of juvenile ESA-listed anadromous salmonids. Additionally, the screens will potentially be operated from March 1, 2004, until March 31, 2004. The screens will be replaced with those that meet NOAA Fisheries' juvenile screen criteria by March 31, 2004.

The BPA has also indicated that the screen replacement operation will be LAA ESA-listed anadromous salmonids. The existing screens would be removed using a truck boom and crane which would operate from the bank near the pump station. The new screens will be placed using the same equipment. No physical disturbance of the bank is expected from screen removal or replacement. The screen removal and replacement is expected to dislodge some sediment, and the in-water activity is expected to frighten juvenile anadromous salmonids from the work area.

1.3 Description of the Action Area

An action area is defined by the Services' regulations (50 CFR Part 402) as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The action area affected by the proposed action starts at the project location at the pump screen intake for the WWA and extends upstream or downstream based on the potential for impairing fish passage, stream hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect effects may occur throughout the watershed, where actions described in this Opinion lead to additional activities, or affect ecological functions, contributing to stream degradation. As such, the action area for proposed Project includes the immediate portions of the watershed containing the Project (the WWA), and includes a radius of 150 feet around the pump screen area in and along the Columbia River at the WWA. NOAA Fisheries believes that these areas are those that may reasonably be affected, temporarily or in the long term, by the proposed Project. This area of the Columbia River serves primarily as a migratory corridor for juvenile and adult ESA-listed anadromous salmonids.

2. ENDANGERED SPECIES ACT - BIOLOGICAL OPINION

The objective of this Opinion is to determine whether the proposed Project is likely to jeopardize the continued existence of ESA-listed anadromous salmonids or adversely modify their designated critical habitat.

2.1 Evaluating the Effects of the Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA. In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations and when appropriate combines them with The Habitat Approach (NOAA Fisheries 1999): (1) Consider the biological requirements and status of the listed species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species, and whether the action is consistent with any available recovery strategy; and (4) determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects, and considering measures for survival and recovery specific to other life stages. In completing the jeopardy analysis, NOAA Fisheries determines whether the action under consultation, together with all cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species or adversely modify their critical habitat. If jeopardy is found, NOAA Fisheries may identify reasonable and prudent alternatives for the action that avoid jeopardy.

The fourth step above (jeopardy determination) requires a two-part analysis. The first part focuses on the action area and defines the proposed action's effects in terms of the species' biological requirements in that area (*i.e.*, effects on essential features). The second part focuses on the species itself. It describes the action's effects on individual fish, populations, or both, and places that impact in the context of the ESU as a whole. Ultimately, the analysis seeks to determine whether the proposed action is likely to jeopardize a listed species' continued existence or adversely modify their critical habitat.

2.1.1 Biological Requirements

The first step NOAA Fisheries uses when applying ESA section 7(a)(2) to the listed ESUs considered in this Opinion includes defining the species' biological requirements within the action area. Biological requirements are population characteristics necessary for the listed ESUs to survive and recover to naturally reproducing population sizes at which protection under the ESA would become unnecessary. The listed species' biological requirements may be described as characteristics of the habitat, population or both (McElhany *et al.*, 2000).

For actions that affect freshwater habitat, NOAA Fisheries may describe the habitat portion of a species' biological requirements in terms of a concept called properly functioning condition (PFC). The PFC is defined as the sustained presence of natural, habitat-forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation (NOAA Fisheries 1999). The PFC, then, constitutes the habitat component of a species' biological requirements. Although NOAA Fisheries is not required to use a particular procedure to describe biological requirements, it typically considers the status of habitat variables in a matrix of pathways and indicators (MPI) (NOAA Fisheries 1996b) that were developed to describe PFC in forested montane watersheds. In the PFC framework, baseline environmental conditions are described as "properly functioning," "at risk," or "not properly functioning".

The proposed Project would occur within designated critical habitat for the SR fall-run chinook, SR spring/summer-run chinook salmon, and SR sockeye salmon ESUs. Freshwater critical habitat can include all waterways, substrates, and adjacent riparian areas[3] below longstanding, natural impassable barriers (*i.e.*, natural waterfalls in existence for at least several hundred years) and dams that block access to former habitat.

Essential features of critical habitat for the listed species are: (1) Substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food (juvenile only), (8) riparian vegetation, (9) space, and (10) safe passage conditions. For this consultation, the essential features that function to support successful adult and juvenile migration, adult holding, spawning, incubation, rearing, and growth and development to adulthood include water quantity, water velocity, food, and safe passage conditions.

[3]Riparian areas adjacent to a stream provide the following functions: shade, sediment delivery/filtering, nutrient or chemical regulation, streambank stability, and input of large woody debris and fine organic matter.

2.1.2 Status and Generalized Life History of Listed Species

NOAA Fisheries also considers the current status of the listed species within the action area, taking into account population size, trends, distribution, and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species and also considers any new data that is relevant to the species' status.

The BPA has found that the WWA irrigation activities are LAA ESA-listed anadromous salmonids or their designated critical habitat. Based on the life histories of these ESUs, the action agency determined that it is likely that juvenile ESA-listed anadromous salmonids or their designated critical habitat may be adversely affected by the proposed action.

Actions permitted in the proposed Project would occur within designated critical habitat for 3 of the 7 listed ESUs considered in this Opinion. Those ESA-listed anadromous salmonids with designated critical habitat as well as their essential elements of designated critical habitat are described section 2.1.1, above. Actions described in this Opinion may affect substrate, water quality, water quantity, water velocity, food, and safe passage conditions.

Additional background on listing status, biological information for all seven listed ESU's, and critical habitat elements for three of these seven listed ESUs are described below. Information presented here for Columbia Basin ESUs is adapted from Appendix A to the paper "A Standardized Quantitative Analysis of the Risks Faced by Salmonids in the Columbia River Basin" (McClure *et al.* 2000a). Further details regarding the life histories, factors for decline, and current range wide status of these species are found in NOAA Fisheries (2000).

<u>SR Fall-run Chinook Salmon</u>
The Snake River basin drains an area of approximately 280,000 km^2 and incorporates a range of vegetative life zones, climatic regions, and geological formations, including the deepest canyon (Hells Canyon) in North America. The ESU includes the mainstem river and all tributaries, from their confluence with the Columbia River to the Hells Canyon Dam complex. Because genetic analyses indicate that fall-run chinook salmon in the Snake River are distinct from the spring/summer-run in the Snake River basin (Waples *et al.* 1991), SR fall-run chinook salmon are considered separately from the other two forms. They are also considered separately from those assigned to the UCR summer- and fall-run ESU because of considerable differences in habitat characteristics and adult ocean distribution and less definitive, but still significant, genetic differences. There is, however, some concern that recent introgression from Columbia River hatchery strays is causing the Snake River population to lose the qualities that made it a distinct ESU.

SR fall-run chinook salmon remained stable at high levels of abundance through the first part of the twentieth century, but then declined substantially. Although the historical abundance of fall-run chinook salmon in the Snake River is difficult to estimate, adult returns appear to have declined by three orders of magnitude since the 1940s, and perhaps by another order of magnitude from pristine levels. Irving and Bjornn (1981) estimated that the mean number of fall-run chinook salmon returning to the Snake River declined from 72,000 during the period 1938 to 1949, to 29,000 during the 1950s. Further declines occurred upon completion of the Hells Canyon Dam complex, which blocked access to primary production areas in the late 1950s (see below).

Fall-run chinook salmon in this ESU are ocean-type. Adults return to the Snake River at ages 2 through 5, with age 4 most common at spawning (Chapman *et al.* 1991). Spawning, which takes place in late fall, occurs in the mainstem and in the lower parts of major tributaries (NWPPC 1989; Bugert *et al.* 1990). Juvenile fall-run chinook salmon move seaward slowly as subyearlings, typically within several weeks of emergence (Chapman *et al.* 1991). Based on modeling by the Chinook Technical Committee, the Pacific Salmon Commission estimates that a significant proportion of the SR fall-run chinook (about 36%) are taken in Alaska and Canada, indicating a far-ranging ocean distribution. In recent years, only 19% were caught off Washington, Oregon, and California, with the balance (45%) taken in the Columbia River (Simmons 2000).

With hydrosystem development, the most productive areas of the Snake River basin are now inaccessible or inundated. The upper reaches of the mainstem Snake River were the primary areas used by fall-run chinook salmon, with only limited spawning activity reported downstream from river kilometer (Rkm) 439. The construction of Brownlee Dam (1958; Rkm 459), Oxbow Dam (1961; Rkm 439), and Hells Canyon Dam (1967; Rkm 397) eliminated the primary production areas of SR fall-run chinook salmon. There are now 12 dams on the mainstem Snake River, and they have substantially reduced the distribution and abundance of fall-run chinook salmon (Irving and Bjornn 1981).

The Snake River has contained hatchery-reared fall-run chinook salmon since 1981 (Busack 1991). The hatchery contribution to Snake River escapement has been estimated at greater than 47% (Myers *et al.* 1998). Artificial propagation is recent, so cumulative genetic changes associated with it may be limited. Wild fish are incorporated into the brood stock each year, which should reduce divergence from the wild population. Release of subyearling fish may also help minimize the differences in mortality patterns between hatchery and wild populations that can lead to genetic change (Waples 1999). (See NOAA Fisheries [1999a] for further discussion of the SR fall-run chinook salmon supplementation program.)

Some SR fall-run chinook historically migrated over 1,500 km from the ocean. Although the Snake River population is now restricted to habitat in the lower river, genes associated with the lengthier migration may still reside in the population. Because longer freshwater migrations in chinook salmon tend to be associated with more-extensive oceanic migrations (Healey 1983), maintaining populations occupying habitat that is well inland may be important in continuing diversity in the marine ecosystem as well.

For the SR fall-run chinook salmon ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period[4] ranges from 0.94 to 0.86, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al.* 2000b).

<u>SR Spring/Summer-run Chinook Salmon</u>
The location, geology, and climate of the Snake River region create a unique aquatic ecosystem for chinook salmon. Spring-run and/or summer-run chinook salmon are found in several subbasins of the Snake River (CBFWA 1990). Of these, the Grande Ronde and Salmon Rivers are large, complex systems composed of several smaller tributaries that are further composed of many small streams. In contrast, the Tucannon and Imnaha Rivers are small systems with most salmon production in the main river. In addition to these major subbasins, three small streams (Asotin, Granite, and Sheep Creeks) that enter the Snake River between Lower Granite and Hells Canyon Dams provide small spawning and rearing areas (CBFWA 1990). Although there are some indications that multiple ESUs may exist within the Snake River basin, the available data do not clearly demonstrate their existence or define their boundaries.

Historically, spring and/or summer-run chinook salmon spawned in virtually all accessible and suitable habitat in the Snake River system (Evermann 1895; Fulton 1968). During the late 1800s, the Snake River produced a substantial fraction of all Columbia Basin spring and summer chinook salmon, with total production probably exceeding 1.5 million in some years. By the mid-1900s, the abundance of adult spring and summer chinook salmon had greatly declined. Fulton (1968) estimated that an average of 125,000 adults per year entered the Snake River tributaries from 1950 through 1960. As evidenced by adult counts at dams, however, spring and summer chinook salmon have declined considerably since the 1960s.

In the Snake River, spring and summer chinook share key life history traits. Both are stream-type fish, with juveniles that migrate swiftly to sea as yearling smolts. Depending primarily on location within the basin (and not on run type), adults tend to return after either 2 or 3 years in the ocean. Both spawn and rear in small, high-elevation streams (Chapman *et al.* 1991), although where the two forms coexist, spring-run chinook spawn earlier and at higher elevations than summer-run chinook.

Even before mainstem dams were built, habitat was lost or severely damaged in small tributaries by construction and operation of irrigation dams and diversions, inundation of spawning areas by impoundments, and siltation and pollution from sewage, farming, logging, and mining (Fulton 1968). Recently, the construction of hydroelectric and water storage dams without adequate provision for adult and juvenile passage in the upper Snake River has kept fish from all spawning areas upstream of Hells Canyon Dam.

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[4] Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals presented here and below are based on population trends observed during a base period beginning in 1980. Population trends are projected under the assumption that all conditions will stay the same into the future. For further information, see, NOAA Fisheries (2000a).

There is a long history of human efforts to enhance production of chinook salmon in the Snake River basin through supplementation and stock transfers. The evidence is mixed as to whether these efforts have altered the genetic makeup of indigenous populations. Straying rates appear to be very low.

For the SR spring/summer-run chinook salmon ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period 1 ranges from 0.96 to 0.80, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to the effectiveness of fish of wild origin (Tables B-2a and B-2b in McClure *et al.* 2000b).

<u>UCR Spring-run Chinook Salmon</u>
This ESU includes spring-run chinook populations found in Columbia River tributaries between Rock Island and Chief Joseph Dams, notably the Wenatchee, Entiat, and Methow River Basins. The populations are genetically and ecologically separate from the summer- and fall-run populations in the lower parts of many of the same river systems (Myers *et al.* 1998). Although fish in this ESU are genetically similar to spring chinook in adjacent ESUs (*i.e.*, mid-Columbia and Snake), they are distinguished by ecological differences in spawning and rearing habitat preferences. For example, spring-run chinook in upper Columbia River tributaries spawn at lower elevations (500 to 1,000 m) than in the Snake and John Day River systems.

The upper Columbia River populations were intermixed during the Grand Coulee Fish Maintenance Project (1939 through 1943), resulting in loss of genetic diversity between populations in the ESU. Homogenization remains an important feature of the ESU. Fish abundance has trended downward both recently and over the long term. At least six former populations from this ESU are now extinct, and nearly all extant populations have fewer than 100 wild spawners.

UCR spring-run chinook are considered stream-type fish, with smolts migrating as yearlings. Most stream-type fish mature at 4 years of age. Few coded wire tags (CWTs) are recovered in ocean fisheries, suggesting that the fish move quickly out of the north central Pacific and do not migrate along the coast.

Spawning and rearing habitat in the Columbia River and its tributaries upstream of the Yakima River includes dry areas where conditions are less conducive to steelhead survival than in many other parts of the Columbia Basin (Mullan *et al.* 1992). Salmon in this ESU must pass up to nine Federal and private dams, and Chief Joseph Dam prevents access to historical spawning grounds farther upstream. Degradation of remaining spawning and rearing habitat continues to be a major concern associated with urbanization, irrigation projects, and livestock grazing along riparian corridors. Overall harvest rates are low for this ESU, currently less than 10% (ODFW and WDFW 1995).

Spring-run chinook salmon from the Carson National Fish Hatchery (a large composite, non-native stock) were introduced into, and have been released from, local hatcheries (Leavenworth, Entiat, and Winthrop National Fish Hatcheries [NFH]). Little evidence suggests that these hatchery fish stray into wild areas or hybridize with naturally-spawning populations. In addition to these national production hatcheries, two supplementation hatcheries are operated by the WDFW in this ESU. The Methow Fish Hatchery Complex (operations began in 1992) and the Rock Island Fish Hatchery Complex (operations began in 1989) were both designed to implement supplementation programs for naturally-spawning populations on the Methow and Wenatchee Rivers, respectively (Chapman *et al.* 1995).

For the UCR spring-run chinook salmon ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period ranges from 0.85 to 0.83, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al.* 2000b). NOAA Fisheries used population risk assessments for UCR spring-run chinook salmon and steelhead ESUs from the draft quantitative analysis report (QAR) (Cooney 2000). Risk assessments described in that report were based on Monte Carlo simulations with simple spawner/spawner models that incorporate estimated smolt carrying capacity. Population dynamics were simulated for three separate spawning populations in the UCR spring-run chinook salmon ESU, the Wenatchee, Entiat, and Methow populations. The QAR assessments showed extinction risks for UCR spring chinook salmon of 50% for the Methow, 98% for the Wenatchee, and 99% for the Entiat spawning populations. These estimates are based on the assumption that the median return rate for the 1980 brood year to the 1994 brood year series will continue into the future.

<u>SR Sockeye Salmon</u>
The only remaining anadromous sockeye in the Snake River system are found in Redfish Lake, on the Salmon River. The nonanadromous form (kokanee), found in Redfish Lake and elsewhere in the Snake River Basin, is included in the ESU. Snake River sockeye were historically abundant in several lake systems of Idaho and Oregon. However, all populations have been extirpated in the past century, except fish returning to Redfish Lake.

In general, juvenile sockeye salmon rear in the lake environment for 1, 2, or 3 years before migrating to sea. Adults typically return to the natal lake system to spawn after spending 1, 2, 3, or 4 years in the ocean (Gustafson *et al.* 1997).

In 1910, impassable Sunbeam Dam was constructed 20 miles downstream of Redfish Lake. Although several fish ladders and a diversion tunnel were installed during subsequent decades, it is unclear whether enough fish passed above the dam to sustain the run. The dam was partly removed in 1934, after which Redfish Lake runs partially rebounded. Evidence is mixed as to whether the restored runs constitute anadromous forms that managed to persist during the dam years, nonanadromous forms that became migratory, or fish that strayed in from outside the ESU.

NOAA Fisheries proposed an interim recovery level of 2,000 adult Snake River sockeye salmon in Redfish Lake and two other lakes in the Snake Basin (Table 1.3-1 in NOAA Fisheries 1995). Low numbers of adult SR sockeye salmon preclude a QAR-type quantitative analysis of the status of this ESU. Because only 16 wild and 264 hatchery-produced adult sockeye returned to the Stanley River Basin between 1990 and 2000, NOAA Fisheries considers the status of this ESU to be dire under any criteria. Clearly the risk of extinction is very high.

UCR Steelhead

The UCR steelhead ESU occupies the Columbia Basin upstream of the Yakima River. Rivers in the area primarily drain the east slope of the northern Cascade Mountains and include the Wenatchee, Entiat, Methow, and Okanogan River basins. The climate of the area reaches temperature and precipitation extremes; most precipitation falls as mountain snow (Mullan *et al.* 1992b). The river valleys are deeply dissected and maintain low gradients, except for the extreme headwaters (Franklin and Dyrness 1973).

Estimates of historical (pre-1960s) abundance specific to this ESU are available from fish counts at dams. Counts at Rock Island Dam (RM 353.8 on the Columbia River) from 1933 to 1959 averaged 2,600 to 3,700, suggesting a prefishery run size exceeding 5,000 adults for tributaries above Rock Island Dam (Chapman *et al.* 1994). Runs may, however, already have been depressed by lower Columbia River fisheries.

As in other inland ESUs (the Snake and mid-Columbia Basins), steelhead in the Upper Columbia River ESU remain in freshwater up to a year before spawning. Smolt age is dominated by 2-year-olds. Based on limited data, steelhead from the Wenatchee and Entiat rivers return to freshwater after 1 year in salt water, whereas Methow River steelhead are primarily age-2-ocean (Howell *et al.* 1985). Life history characteristics for UCR steelhead are similar to those of other inland steelhead ESUs; however, some of the oldest smolt ages for steelhead, up to 7 years, are reported from this ESU. The relationship between anadromous and nonanadromous forms in the geographic area is unclear.

The Chief Joseph and Grand Coulee Dam construction caused blockages of substantial habitat, as did that of smaller dams on tributary rivers. Habitat issues for this ESU relate mostly to irrigation diversions and hydroelectric dams, as well as to degraded riparian and instream habitat from urbanization and livestock grazing.

Hatchery fish are widespread and escape to spawn naturally throughout the region. Spawning escapement is dominated by hatchery-produced fish.

For the UCR steelhead ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period ranges from 0.94 to 0.66, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al.* 2000b). Because of data limitations, the QAR steelhead assessments in Cooney (2000) were limited to two aggregate spawning groups—the Wenatchee/Entiat composite and the above-Wells populations. Wild production of steelhead above Wells Dam was assumed to be limited to the Methow system. Assuming a relative effectiveness of hatchery spawners of 1.0, the risk of absolute extinction within 100 years for UCR steelhead is 100 percent. The QAR also assumed hatchery effectiveness values of 0.25 and 0.75. A hatchery effectiveness of 0.25 resulted in projected risks of extinction of 35% for the

Wenatchee/Entiat and 28% for the Methow populations. At a hatchery effectiveness of 0.75, risks of 100% were projected for both populations.

SR Basin Steelhead

Steelhead spawning habitat in the Snake River is distinctive in having large areas of open, low-relief streams at high elevations. In many Snake River tributaries, spawning occurs at a higher elevation (up to 2,000 m) than for steelhead in any other geographic region. SR Basin steelhead also migrate farther from the ocean (up to 1,500 km) than most.

No estimates of historical (pre-1960s) abundance specific to this ESU are available.

Fish in this ESU are summer-run steelhead. They enter freshwater from June to October and spawn during the following March to May. Two groups are identified, based on migration timing, ocean-age, and adult size. A-run steelhead, thought to be predominately age-1-ocean, enter freshwater during June through August. B-run steelhead, thought to be age-2-ocean, enter freshwater during August through October. B-run steelhead typically are three to four inches longer at the same age. Both groups usually smolt as 2- or 3-year-olds (Whitt 1954, Hassemer 1992). All steelhead are iteroparous, capable of spawning more than once before death.

Hydrosystem projects create substantial habitat blockages in this ESU; the major ones are the Hells Canyon Dam complex (mainstem Snake River) and Dworshak Dam (North Fork Clearwater River). Minor blockages are common throughout the region. Steelhead spawning areas have been degraded by overgrazing, as well as by historical gold dredging and sedimentation due to poor land management. Habitat in the Snake River basin is warmer and drier and often more eroded than elsewhere in the Columbia Basin or in coastal areas.

Hatchery fish are widespread and stray to spawn naturally throughout the region. In the 1990s, an average of 86% of adult steelhead passing Lower Granite Dam were of hatchery origin. Hatchery contribution to naturally-spawning populations varies, however, across the region. Hatchery fish dominate some stocks, but do not contribute to others.

For the SR Basin steelhead ESU as a whole, NOAA Fisheries estimates that the median population growth rate (lambda) over the base period ranges from 0.91 to 0.70, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to that of fish of wild origin (Tables B-2a and B-2b in McClure *et al.* 2000b).

MCR Steelhead

The MCR steelhead ESU occupies the Columbia River Basin from above the Wind River in Washington and the Hood River in Oregon and continues upstream to include the Yakima River, Washington. The region includes some of the driest areas of the Pacific Northwest, generally receiving less than 16 inches of precipitation annually (Jackson 1993). Summer steelhead are widespread throughout the ESU; winter steelhead occur in Mosier, Chenowith, Mill, and Fifteenmile creeks, Oregon, and in the Klickitat and White Salmon Rivers, Washington. The

John Day River probably represents the largest native, natural spawning stock of steelhead in the region.

Estimates of historical (pre-1960s) abundance specific to this ESU are available for the Yakima River, which has an estimated run size of 100,000 (WDF *et al.* 1993). Assuming comparable run sizes for other drainage areas in this ESU, the total historical run size may have exceeded 300,000 steelhead.

Most fish in this ESU smolt at 2 years and spend 1 to 2 years in salt water before reentering freshwater, where they may remain up to a year before spawning (Howell *et al.* 1985, BPA 1992). All steelhead upstream of The Dalles Dam are summer-run (Schreck *et al.* 1986, Reisenbichler *et al.* 1992, Chapman *et al.* 1994). The Klickitat River, however, produces both summer and winter steelhead, and age-2-ocean steelhead dominate the summer steelhead, whereas most other rivers in the region produce about equal numbers of both age-1- and 2-ocean fish. A nonanadromous form co-occurs with the anadromous form in this ESU; information suggests that the two forms may not be isolated reproductively, except where barriers are involved.

The only substantial habitat blockage now present in this ESU is at Pelton Dam on the Deschutes River, but minor blockages occur throughout the region. Water withdrawals and overgrazing have seriously reduced summer flows in the principal summer steelhead spawning and rearing tributaries of the Deschutes River. This is significant because high summer and low winter temperatures are limiting factors for salmonids in many streams in this region (Bottom *et al.* 1984).

Continued increases in the proportion of stray steelhead in the Deschutes Basin is a major concern. The Oregon Department of Fish and Wildlife (ODFW) and the Confederated Tribes of the Warm Springs Reservation of Oregon (CTWSRO) estimate that 60% to 80% of the naturally-spawning population consists of strays, which greatly outnumber naturally-produced fish. Although the reproductive success of stray fish has not been evaluated, their numbers are so high that major genetic and ecological effects on natural populations are possible (Busby *et al.* 1999). The negative effects of any interbreeding between stray and native steelhead will be exacerbated if the stray steelhead originated in geographically distant river basins, especially if the river basins are in different ESUs. The populations of steelhead in the Deschutes Basin include steelhead native to the Deschutes River, hatchery steelhead from the Round Butte Hatchery on the Deschutes River, wild steelhead strays from other rivers in the Columbia Basin, and hatchery steelhead strays from other Columbia Basin streams

Regarding the latter, CTWSRO reports preliminary findings from a tagging study by T. Bjornn and M. Jepson (University of Idaho) and NOAA Fisheries suggesting that a large fraction of the steelhead passing through Columbia River dams (*e.g.*, John Day and Lower Granite dams) have entered the Deschutes River and then returned to the mainstem Columbia River. A key unresolved question about the large number of strays in the Deschutes basin is how many stray fish remain in the basin and spawn naturally.

Essential features of the adult spawning, juvenile rearing, and adult and migratory habitat for the ESA-listed anadromous salmonid species are: Substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. (Bjornn and Reiser, 1991; NOAA Fisheries, 1996c; Spence *et al.*, 1996). The essential features that the proposed Project may affect are: Substrate, water quality, water temperature, water velocity, cover/shelter, food, and riparian vegetation.

2.1.3 Environmental Baseline in the Action Area

The environmental baseline is defined as: "The past and present impacts of all Federal, state, or private actions and other human activities in the action area, including the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation and the impacts of state and private actions that are contemporaneous with the consultation in progress" (50 CFR 402.02). NOAA Fisheries' evaluates the relevance of the environmental baseline in the action area to the species' current status. In describing the environmental baseline, NOAA Fisheries evaluates essential features of critical habitat and the listed Pacific salmon ESUs affected by the proposed action.

In general, the environment for listed species in the Columbia River Basin (CRB), including those that migrate past or spawn upstream from the action area, has been dramatically affected by the development and operation of the Federal Columbia River Power System (FCRPS). Storage dams have eliminated mainstem spawning and rearing habitat, and have altered the natural flow regime of the Snake and Columbia Rivers, decreasing spring and summer flows, increasing fall and winter flow, and altering natural thermal patterns. Power operations cause fluctuation in flow levels and river elevations, affecting fish movement through reservoirs, disturbing riparian areas and possibly stranding fish in shallow areas as flows recede. The eight dams in the migration corridor of the Snake and Columbia Rivers kill or injure a portion of the smolts passing through the area. The low velocity movement of water through the reservoirs behind the dams slows the smolts' journey to the ocean and enhances the survival of predatory fish (Independent Scientific Group 1996, National Research Council 1996). Formerly complex mainstem habitats in the Columbia, Snake, and Willamette Rivers have been reduced, for the most part, to single channels, with floodplains reduced in size, and off-channel habitats eliminated or disconnected from the main channel (Sedell and Froggatt 1984; Independent Scientific Group 1996; and Coutant 1999). The amount of large woody debris in these rivers has declined, reducing habitat complexity and altering the rivers' food webs (Maser and Sedell 1994).

Other human activities that have degraded aquatic habitats or affected native fish populations in the CRB include stream channelization, elimination of wetlands, construction of flood control dams and levees, construction of roads (many with impassable culverts), timber harvest, splash dams, mining, water withdrawals, unscreened water diversions, agriculture, livestock grazing, urbanization, outdoor recreation, fire exclusion/suppression, artificial fish propagation, fish harvest, and introduction of non-native species (Henjum *et al.* 1994; Rhodes *et al.* 1994; National Research Council 1996; Spence *et al.* 1996; and Lee *et al.* 1997). In many watersheds, land management and development activities have: (1) Reduced connectivity (*i.e.*, the flow of energy, organisms, and materials) between streams, riparian areas, floodplains, and uplands; (2) elevated fine sediment yields, degrading spawning and rearing habitat; (3) reduced large woody material that traps sediment, stabilizes streambanks, and helps form pools; (4) reduced vegetative canopy that minimizes solar heating of streams; (5) caused streams to become straighter, wider, and shallower, thereby reducing rearing habitat and increasing water temperature fluctuations; (6) altered peak flow volume and timing, leading to channel changes and potentially altering fish migration behavior; and (7) altered floodplain function, water tables and base flows (Henjum *et al.* 1994; McIntosh *et al.* 1994; Rhodes *et al.* 1994; Wissmar *et al.* 1994; National Research Council 1996; Spence *et al.* 1996; and Lee *et al.* 1997).

To address problems inhibiting salmonid recovery in CRB tributaries, the Federal resource and land management agencies developed the *All H Strategy* (Federal Caucus 2000). Components of the *All H Strategy* commit these agencies to increased coordination and a fast start on protecting and restoring salmonid habitats and populations.

The BA received for the proposed project did not evaluate the environmental baseline conditions within the action area using the "matrix of pathways and indicators" (MPI) described in *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NOAA Fisheries 1996c). Although this method was not used, within the Columbia River basin, the biological requirements of the listed species are not currently being met under the environmental baseline. Conditions in the action area would have to improve, and any further degradation of the baseline, or delay in improvement of these conditions would probably further decrease the likelihood of survival and recovery of the listed species under the environmental baseline.

Pacific salmon populations also are substantially affected by variation in the freshwater and marine environments. Ocean conditions are a key factor in the productivity of Pacific salmon populations. Stochastic events in freshwater (flooding, drought, snowpack conditions, volcanic eruptions, *etc.*) can play an important role in a species' survival and recovery, but those effects tend to be localized compared to the effects associated with the ocean. The survival and recovery of these species depends on their ability to persist through periods of low natural survival due to ocean conditions, climatic conditions, and other conditions outside the action area. Freshwater survival is particularly important during these periods because enough smolts must be produced so that a sufficient number of adults can survive to complete their oceanic migration, return to spawn, and perpetuate the species. Therefore, it is important to maintain or restore essential features to sustain the ESU through these periods. Additional details about the importance of freshwater survival to Pacific salmon populations can be found in Federal Caucus (2000), NOAA Fisheries (2000), and Oregon Progress Board (2000).

2.2 Analysis of Effects

Effects of the action are defined as: "the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with the action, that will be added to the environmental baseline" (50 CFR 402.02). Direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing the value of habitat for meeting the species' biological requirements or impairing the essential features of critical habitat. Indirect effects are defined in 50 CFR 402.02 as "those that are caused by the proposed action and are later in time, but still are reasonably certain to occur". They include the effects on listed species or habitat of future activities that are induced by the proposed action and that occur after the action is completed. "Interrelated actions are those that are part of a larger action and depend on the larger action for their justification" (50 CFR 402.02). "Interdependent actions are those that have no independent utility apart from the action under consideration" (50 CFR 402.02).

In the jeopardy and adverse modification analysis, NOAA Fisheries evaluates the effects of proposed actions on listed species and seeks to answer the question of whether the species can be expected to survive with an adequate potential for recovery. In watersheds where critical habitat has been designated, NOAA Fisheries must make a separate determination of whether the action will result in the destruction or adverse modification of critical habitat (ESA, section 3, (3) and section 3(5A)).

2.2.1 Habitat Effects

NOAA Fisheries will consider any scientifically-credible analytical framework for determining an activity's effect. To streamline the consultation process and to lead to more consistent effects determinations across agencies, NOAA Fisheries, where appropriate, recommends that action agencies use the MPI and procedures in NOAA Fisheries (1996b), particularly when their proposed action would take place in forested montane environments. NOAA Fisheries is working on similar procedures for other environments. Regardless of the analytical method used, if a proposed action is likely to impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of impaired habitat toward PFC, it cannot be found consistent with conserving the species.

For the streams typically considered in salmon habitat-related consultations, a watershed is a logical unit for analysis of potential effects of an action (particularly for actions that are large in scope or scale). Healthy salmonid populations use habitats throughout watersheds (Naiman *et al.* 1992), and riverine conditions reflect biological, geological and hydrological processes operating at the watershed level (Nehlsen *et al.* 1997; Bisson *et al.* 1997; and NOAA Fisheries 1999).

Although NOAA Fisheries prefers watershed-scale consultations due to greater efficiency in reviewing multiple actions, increased analytic ability, and the potential for more flexibility in management practices, often it must analyze effects at geographic areas smaller than a watershed or basin due to a proposed action's scope or geographic scale. Analyses that are focused at the scale of the site or stream reach may not be able to discern whether the effects of the proposed action will contribute to or be compounded by the aggregate of watershed impacts. This loss of analytic ability typically should be offset by more risk averse proposed actions and ESA analysis to achieve parity of risk with the watershed approach (NOAA Fisheries 1999).

The BA for the proposed Project provides an analysis of the effects of the proposed action on ESA-listed anadromous salmonids and their designated critical habitat in the action area. The analysis in the BA uses the best scientific and commercial data available to evaluate elements of the proposed action that have the potential to affect the listed fish or essential features of their habitat.

The replacement of pump screens and interim operation of the pumps until screens are replaced is LAA ESA-listed anadromous salmonids or their designated critical habitat. The expected effects of the proposed actions include: (1) Operation of the current screen through March 31, 2004, may injure or kill juveniles which cannot overcome approach velocities near the screen surface; (2) sediment from the removal and installation activities may increase in the short term, and will harass juvenile ESA-listed anadromous salmonids rearing in the area; (3) improved survival for ESA-listed anadromous salmonids which may rear or migrate through the area is expected from screen replacement. All habitat conditions in the MPI for the Columbia River will be maintained in the long term. The greatest potential for direct effects from the pump operation will be potential for impingement on the existing screens during interim operation period and the greatest potential for direct effects from screen replacement is the harassment of fish during construction.

Potential impacts to listed salmonids from the in-water and near-water construction activities include both direct and indirect effects. Potential direct effects include mortality from exposure to suspended sediments (turbidity) and contaminants resulting from screen removal and replacement. Potential indirect effects include behavioral changes resulting from elevated turbidity level (Sigler *et al.* 1984, Berg and Northcote 1985, Whitman *et al.* 1982, Gregory 1998). As the existing screens are removed, some sediment may be dislodged from the river bed and suspended in the water column. Sediment generated from current screen removal is expected to be minor, and short in duration. Any juvenile ESA-listed anadromous salmonids which may be present during screen removal should be able to avoid the sediment created from removal.

There is also the potential for fuel or other contaminant spills associated with use of heavy equipment in or near the stream. As with all construction activities, accidental release of fuel, oil, and other contaminants may occur. Operation the boom truck requires the use of fuel, lubricants, *etc.*, which, if spilled into the channel of a waterbody or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain poly-cyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985).

Additionally, direct effects to juvenile ESA-listed anadromous salmonids will occur in the form of harassment as they are frightened from the action area. As the current screens are removed, and new screens replaced, construction activity will occur in or around the water. The activity required to attach cables, detach existing pipe, and guide the removal and installation of the screens is expected to frighten any ESA-listed anadromous salmonids from the area. Once these juvenile ESA-listed anadromous salmonids are frightened from cover and swim to open water, they become more susceptible to predation from larger fish and avian predators. Stress approaching or exceeding the physiological tolerance limits of individual fish can impair reproductive success, growth, resistance to infectious diseases, and general survival (Wedemeyer *et al.* 1990).

Reduction in riparian vegetation is expected to be minimal because the proposed action will disturb only the minimal area needed. The screen removal and replacement is not expected to damage the streambank or riparian vegetation measurably.

In the long term, the proposed action will have beneficial effects on ESA-listed anadromous salmonids. Replacing the existing screens with screens that meet the NOAA Fisheries guidance is expected to decrease the likelihood that juvenile ESA-listed anadromous salmonids will be impinged on the pump screens.

2.2.2 Species Effects

The effect that a proposed action has on particular essential features or MPI pathways can be translated into a likely effect on population growth rate. In the case of this consultation, it is not possible to quantify an incremental change in survival for ESA-listed anadromous salmonids.

While population growth rates have been calculated at the large ESU scale, changes to the environmental baseline from the proposed action were described only within the action area. An action that improves habitat in a watershed, and thus helps meet essential habitat feature requirements, may therefore, increase lambda for the portion of the ESU in the action area.

Based on the effects described above, the proposed screen replacement will have a long-term positive effect on the survival and recovery of ESA-listed anadromous salmonids. Because the action area is small compared to the range of ESA-listed anadromous salmonids, a population increase may not be measurable at the ESU scale. However, because the project will reduce the risk of injury or death for ESA-listed anadromous salmonids, an increase in the use and survival of ESA-listed anadromous salmonids within the project area may be expected to occur.

2.2.3 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as “those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation”. These activities within the action area also have the potential to adversely affect the listed species and critical habitat. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being reviewed through separate section 7 consultation processes.

Federal actions that have already undergone section 7 consultation have been added to the description of the environmental baseline in the action area.

State, Tribal, and local government actions will likely include legislation, administrative rules or policy initiatives. Government and private actions may encompass changes in land and water uses–including ownership and intensity–any of which could adversely affect listed species or their habitat. Government actions are subject to political, legislative, and fiscal uncertainties.

Changes in the economy have occurred in the last 15 years, and are likely to continue, with less large-scale resource extraction, more targeted extraction, and significant growth in other economic sectors. Growth in new businesses, primarily in the technology sector, is creating urbanization pressures and increased demands for buildable land, electricity, water supplies, waste-disposal sites, and other infrastructure.

Economic diversification has contributed to population growth and movement, and this trend is likely to continue. Such population trends will result in greater overall and localized demands for electricity, water, and buildable land in the action area; will affect water quality directly and indirectly; and will increase the need for transportation, communication, and other infrastructure. The impacts associated with these economic and population demands will probably affect habitat features such as water quality and quantity, which are important to the survival and recovery of the listed species. The overall effect will likely be negative, unless carefully planned for and mitigated.

Non-federal activities within the action area are expected to increase with a projected 34% increase in human population over the next 25 years in Oregon (Oregon Department of Administrative Services 1999). Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, but at increasingly higher levels as population density climbs. Most future actions by the State of Oregon are described in the Oregon Plan for Salmon and Watershed measures, which includes a variety of programs designed to benefit salmon and watershed health.

The BPA identified no specific private or state actions that are reasonably certain to occur in the future that would affect the ESA-listed anadromous salmonids or any designated critical habitat within the action area. NOAA Fisheries expects slight improvements in ESA-listed anadromous salmonid survival at the action site because of the improved screen design. NOAA Fisheries is not aware of any specific future actions which are reasonably certain to occur on non-federal lands. NOAA Fisheries assumes that future private, Tribal, and state actions will continue at similar intensities as in recent years.

2.2.4 Consistency with Listed Species ESA Recovery Strategies

Recovery is defined by NOAA Fisheries regulations (50 CFR 402) as an "improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4 (a)(1) of the Act". Recovery planning is underway for listed Pacific salmon in the Northwest with technical recovery teams identified for each domain. Recovery planning will help identify measures to conserve listed species and increase the survival of each life stage. NOAA Fisheries also intends that recovery planning identify the areas/stocks most critical to species conservation and recovery and thereby evaluate proposed actions on the basis of their effects on those areas/stocks.

Recovery planning will identify the feasible measures that are needed in each stage of the salmonid life cycle for conservation and survival within a reasonable time. Measures are feasible if they are expected both to be implemented and to result in the required biological benefit. A time period for recovery is reasonable depending on the time requirements for implementation of the measures and the confidence in the survival of the species while the plan is implemented. The plan must demonstrate the feasibility of its measures, the reasonableness of its time requirements, and how the elements are likely to achieve the conservation and survival of the listed species based on the best science available.

NOAA Fisheries has developed guidelines for basin-level, multispecies recovery planning on which individual, species-specific recovery plans can be founded. “Basin-level” encompasses habitat, harvest, hatcheries, and hydro. The recovery planning analysis is contained in the document entitled *Conservation of Columbia Basin Fish: Final Basinwide Salmon Recovery Strategy* (hereafter, the Basinwide Recovery Strategy [Federal Caucus 2000]). The Basinwide Recovery Strategy will be used to guide recovery planing for ESA-listed anadromous salmonids. The recovery plan will provide the particular statutorily required elements of recovery goals, criteria, management actions, and time estimates that are not developed in the Basinwide Recovery Strategy.

Among other things, the Basinwide Recovery Strategy calls for restoration of degraded habitats on a priority basis to produce significant measurable benefits for listed anadromous and resident fish. Until the species-specific recovery plans are developed, the FCRPS Opinion (NOAA Fisheries 2000) and the related Basinwide Recovery Strategy provides the best guidance for judging the significance of an individual action relative to the species-level biological requirements. In the absence of completed recovery plans, NOAA Fisheries strives to ascribe the appropriate significance to actions to the extent available information allows. Where information is not available on the recovery needs of the species, either through recovery planning or otherwise, NOAA Fisheries applies a conservative substitute that approximates what would be expected of an action if such information were available.

The BPA has specific commitments under the Basinwide Salmon Recovery Strategy. For Federal lands (*i.e.*, US Forest Service, Bureau of Land MAnagement), PACFISH (USDA and USDI 1994), and land management plans define these commitments. Although the scope of the project is limited, the proposed action will help to achieve the primary objectives of the Basinwide Salmon Recovery Strategy.

2.3 Conclusions

NOAA Fisheries has determined that, when the effects of the subject action addressed in this Opinion are added to the environmental baseline and cumulative effects occurring in the action area, they are not likely to jeopardize the continued existence of any of the ESA-listed anadromous salmonids addressed in this Opinion, or destroy or adversely modify designated critical habitat.

NOAA Fisheries' conclusions are based on the following considerations: (1) All instream work will occur during the in-water work window for this area (December 1st to March 31st) (ODFW 2000), and instream work will be limited to the amount described in the BA; and (2) a net increase in survival for ESA-listed anadromous salmonids within the project area is expected due to improved screen design. Thus, the proposed action is not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.4 Conservation Recommendations

Conservation recommendations are defined as "discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information" (50 CFR 402.02). Section 7 (a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. NOAA Fisheries has no conservation recommendations to make at this time regarding the action addressed in this Opinion.

2.5 Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded; (2) new information reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease, pending conclusion of the reinitiated consultation.

2.6 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" [16 USC 1532(19)]. Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding, or sheltering" [50 CFR 222.102]. Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering" [50 CFR 17.3]. Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity. conducted by the Federal agency or applicant" [50 CFR 402.02]. The ESA at section 7(o)(2), removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.6.1 Amount or Extent of Take

NOAA Fisheries anticipates that the proposed action is reasonably certain to result in the incidental take of listed species in this Opinion because the ESA-listed anadromous salmonids are known to occur in the action area; and the proposed action is likely to cause impacts significant enough to cause death or injury, or impair feeding, breeding, migrating, or sheltering for the listed species.

Some level of incidental take is expected to result as juvenile ESA-listed anadromous salmonids are harassed during pump operation with current screens. The screen removal and replacement operation is also expected to result in incidental take in the form of behavior modification (avoidance) as ESA-listed anadromous salmonids which may be in the area are frightened. The screen removal and replacement is also expected to create minor increases in sediment. The temporary increase in sediment and turbidity is expected to cause fish to avoid disturbed areas of the stream, both within and downstream of the action area. Effects from turbidity are expected to be of short duration, because turbidity levels will quickly return to preconstruction levels once instream work is completed. The potential for incidental take in the form of death or sub-lethal effects also exists if toxicants are introduced into the water.

Because of the inherent biological characteristics of aquatic species such the ESA-listed anadromous salmonids in this Opinion, the likelihood of discovering take attributable to this action is very limited. Take associated with the effects of actions such as these are largely unquantifiable in the short term, and may not be measurable as long-term effects on the species' habitat or population levels. Therefore, although NOAA Fisheries expects the habitat-related effects of these actions to cause some low level incidental take, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take because of those habitat-related effects. In instances such as these, NOAA Fisheries designates the expected level of take as "unquantifiable".

2.6.2 Reasonable and Prudent Measures

Reasonable and prudent measures (RPMs) are non-discretionary measures to minimize take, that may or may not already be part of the description of the proposed action. They must be implemented as binding conditions for the exemption in section 7(o)(2) to apply. The BPA has the continuing duty to regulate the activities covered in this incidental take statement. If the BPA fails to require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, contracting, or grant document, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. NOAA Fisheries believes that activities carried out in a manner consistent with these reasonable and prudent measures, except those otherwise identified, will not necessitate further site-specific consultation. Activities which do not comply with all relevant reasonable and prudent measures will require further consultation.

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of ESA-listed anadromous salmonids or their designated critical habitat resulting from implementation of the action.

The BPA shall:

1. Minimize the likelihood of incidental take resulting from general construction activities, riparian disturbance, and in-water work required to complete the proposed Project addressed in this Opinion.

2. Minimize the amount and extent of incidental take from construction activities in or near watercourses by ensuring that an effective spill prevention, containment, and control plan is developed, implemented, and maintained to avoid or minimize point-source pollution both into and within watercourses over the short and the long term.

3. Minimize the likelihood of incidental take resulting from the interim operation of pumps with existing screens..

4. Monitor the effects of the proposed action to determine the actual Project effects on listed fish (50 CFR 402.14 (I)(3)). Monitoring should detect adverse effects of the proposed action, assess the actual levels of incidental take in comparison with anticipated incidental take documented in the Opinion, and detect circumstances where the level of incidental take is exceeded.

2.6.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the action must be implemented in compliance with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (general construction, riparian disturbance, and in-water work), the BPA shall ensure that:

    a. Minimum area. Confine construction impacts to the minimum area necessary to complete the project.
    b. Timing of in-water work. Work below the bankfull elevation[5] will be completed using the most recent preferred in-water work period (December 1 to March 31), as appropriate for the project area, unless otherwise approved in writing by NOAA Fisheries.
    c. Cessation of work. Cease project operations under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.
    d. Preconstruction activity. Complete the following actions before significant[6] alteration of the project area.
        i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.
        ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.
            (1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[7]).
            (2) An oil-absorbing, floating boom whenever surface water is present.
        iii. Temporary erosion controls. All temporary erosion controls will be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.
    e. Heavy Equipment. Restrict use of heavy equipment as follows:

[5] 'Bankfull elevation' means the bank height inundated by a 1.5 to 2-year average recurrence interval and may be estimated by morphological features such average bank height, scour lines and vegetation limits.

[6] 'Significant' means an effect can be meaningfully measured, detected or evaluated.

[7] When available, certified weed-free straw or hay bales will be used to prevent introduction of noxious weeds.

i. Choice of equipment. When heavy equipment will be used, the equipment selected will have the least adverse effects on the environment (*e.g.*, minimally sized, low ground pressure equipment).

ii. Vehicle and material staging. Store construction materials, and fuel, operate, maintain and store vehicles as follows.

(1) To reduce the staging area and potential for contamination, ensure that only enough supplies and equipment to complete a specific job will be stored on-site.

(2) Complete vehicle staging, cleaning, maintenance, refueling, and fuel storage in a vehicle staging area placed 150 feet or more from any stream, waterbody or wetland, unless otherwise approved in writing by NOAA Fisheries.

(3) Inspect all vehicles operated within 150 feet of any stream, waterbody or wetland daily for fluid leaks before leaving the vehicle staging area. Repair any leaks detected in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request by NOAA Fisheries.

(4) Before operations begin and as often as necessary during operation, steam clean all equipment that will be used below bankfull elevation until all visible external oil, grease, mud, and other visible contaminates are removed.

(5) Diaper all stationary power equipment (*e.g.*, generators, cranes, stationary drilling equipment) operated within 150 feet of any stream, waterbody or wetland to prevent leaks, unless suitable containment is provided to prevent potential spills from entering any stream or waterbody.

f. Site preparation. Conserve native materials for site restoration.

i. If possible, leave native materials where they are found.

ii. If materials are moved, damaged or destroyed, replace them with a functional equivalent during site restoration.

iii. Stockpile any large wood[8], native vegetation, weed-free topsoil, and native channel material displaced by construction for use during site restoration.

g. Site restoration. Prepare and carry out a site restoration plan as necessary to ensure that all streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows. Make the written plan available for inspection on request by the NOAA Fisheries.

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[8] For purposes of this Opinion only, 'large wood' means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull channel width of the stream in which the wood occurs. See, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

i. General considerations.

(1) Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (*e.g.*, large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

(2) Streambank shaping. Restore damaged streambanks to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation, unless precluded by pre-project conditions (*e.g.*, a natural rock wall).

(3) Revegetation. Replant each area requiring revegetation before the first April 15 following construction. Use a diverse assemblage of species native to the project area or region, including grasses, forbs, shrubs and trees. Noxious or invasive species may not be used.

(4) Pesticides. Take of ESA-listed species caused by any aspect of pesticide use is not included in the exemption to the ESA take prohibitions provided by this incidental take statement. Pesticide use must be evaluated in an individual consultation, although mechanical or other methods may be used to control weeds and unwanted vegetation.

(5) Fertilizer. Do not apply surface fertilizer within 50 feet of any stream channel.

ii. Plan contents. Include each of the following elements.

(1) Responsible party. The name and address of the party(s) responsible for meeting each component of the site restoration requirements, including providing and managing any financial assurances and monitoring necessary to ensure restoration success.

(2) Baseline information. This information may be obtained from existing sources (*e.g.*, land use plans, watershed analyses, subbasin plans), where available.

(a) A functional assessment of adverse effects, *i.e.*, the location, extent and function of the riparian and aquatic resources that will be adversely affected by construction and operation of the project.

(b) The location and extent of resources surrounding the restoration site, including historic and existing conditions.

(3) Goals and objectives. Restoration goals and objectives that describe the extent of site restoration necessary to offset adverse effects of the project, by aquatic resource type.

(4) Performance standards. Use these standards to help design the plan and to assess whether the restoration goal is met. While no single criterion is sufficient to measure success, the intent is that

these features should be present within reasonable limits of natural and management variation.

(a) Bare soil spaces are small and well dispersed.

(b) Soil movement, such as active rills or gullies and soil deposition around plants or in small basins, is absent or slight and local.

(c) If areas with past erosion are present, they are completely stabilized and healed.

(d) Plant litter is well distributed and effective in protecting the soil with few or no litter dams present.

(e) Native woody and herbaceous vegetation, and germination microsites, are present and well distributed across the site.

(f) Vegetation structure is resulting in rooting throughout the available soil profile.

(g) Plants have normal, vigorous growth form, and a high probability of remaining vigorous, healthy and dominant over undesired competing vegetation.

(h) High impact conditions confined to small areas necessary access or other special management situations.

(i) Streambanks have less than 5% exposed soils with margins anchored by deeply rooted vegetation or coarse-grained alluvial debris.

(j) Few upland plants are in valley bottom locations, and a continuous corridor of shrubs and trees provide shade for the entire streambank.

(5) Work plan. Develop a work plan with sufficient detail to include a description of the following elements, as applicable.

(a) Boundaries for the restoration area.

(b) Restoration methods, timing, and sequence.

(c) Water supply source, if necessary.

(d) Woody native vegetation appropriate to the restoration site.[9] This must be a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees. This may include allowances for natural regeneration from an existing seed bank or planting.

(e) A plan to control exotic invasive vegetation.

(f) Elevation(s) and slope(s) of the restoration area to ensure they conform with required elevation and hydrologic requirements of target plant species.

(g) Geomorphology and habitat features of stream or other open water.

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[9] Use references sites to select vegetation for the mitigation site whenever feasible. Historic reconstruction, vegetation models, or other ecologically-based methods may also be used as appropriate.

(h) Site management and maintenance requirements.

2. To implement reasonable and prudent measure #2 (pollution and erosion control), the BPA shall ensure that:

   a. Pollution and Erosion Control Plan. Prepare and carry out a pollution and erosion control plan to prevent pollution caused by surveying or construction operations. The plan must be available for inspection on request by NOAA Fisheries.

      i. Plan Contents. The pollution and erosion control plan will contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

         (1) The name and address of the party(s) responsible for accomplishment of the pollution and erosion control plan.

         (2) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, drilling sites, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations, staging areas, and roads being decommissioned.

         (3) Practices to confine, remove and dispose of excess concrete, cement, grout, and other mortars or bonding agents, including measures for washout facilities.

         (4) A description of any regulated or hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

         (5) A spill containment and control plan with notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

         (6) Practices to prevent construction debris from dropping into any stream or waterbody, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

      ii. Inspection of erosion controls. During construction, monitor instream turbidity and inspect all erosion controls daily during the rainy season and weekly during the dry season, or more often as necessary, to ensure the erosion controls are working adequately.[10]

         (1) If monitoring or inspection shows that the erosion controls are ineffective, mobilize work crews immediately to make repairs, install replacements, or install additional controls as necessary.

[10] 'Working adequately' means that project activities do not increase ambient stream turbidity by more than 10% above background 100 feet below the discharge, when measured relative to a control point immediately upstream of the turbidity causing activity.

(2) Remove sediment from erosion controls once it has reached 1/3 of the exposed height of the control.

b. Construction discharge water. Treat all discharge water created by construction (*e.g.*, concrete washout, pumping for work area isolation, vehicle wash water, drilling fluids) as follows.

i. Water quality. Design, build and maintain facilities to collect and treat all construction discharge water, including any contaminated water produced by drilling, using the best available technology applicable to site conditions. Provide treatment to remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.

ii. Discharge velocity. If construction discharge water is released using an outfall or diffuser port, velocities may not exceed 4 feet per second, and the maximum size of any aperture may not exceed one inch.

iii. Pollutants. Do not allow pollutants including green concrete, contaminated water, silt, welding slag, sandblasting abrasive, or grout cured less than 24 hours to contact any wetland or the 2-year floodplain.

3. To implement reasonable and prudent measure #3 (interim pump operation), the BPA shall ensure that:

a. Screen depth. Pump operation will cease when screen depth is less than two screen radii below the water surface.

b. Cleaning. During the period of operations, screens will be inspected every 14 days, and cleaned if necessary to ensure that the screen is free of debris and screen mesh is intact.

4. To implement reasonable and prudent measure #4 (monitoring), the BPA shall:

a. Reporting. Within one year of project completion, the BPA will submit a monitoring report to NOAA Fisheries describing the BPAs' success in meeting the terms and conditions contained in this Opinion. The monitoring report will include the following information.

i. Project identification

(1) Project name.

(2) Type of activity.

(3) Project location, including any compensatory mitigation site(s), by 5th field HUC and by latitude and longitude as determined from the appropriate USGS 7-minute quadrangle map.

(4) BPA contact person.

(5) Starting and ending dates for work completed.

ii. Photo documentation. Photos of habitat conditions at the project and any compensation site(s), before, during, and after project completion.[11]

(1) Include general views and close-ups showing details of the project and project area, including pre and post construction.

(2) Label each photo with date, time, project name, photographer's name, and a comment about the subject.

iii. Other data. Additional project-specific data, as appropriate for individual projects.

(1) Work cessation. Dates work ceased due to high flows, if any.

(2) Fish screen. Evidence of compliance with NOAA Fisheries' fish screen criteria.

(3) Pollution control. A summary of pollution and erosion control inspections, including any erosion control failure, contaminant release, and correction effort.

(4) Site preparation.

(a) Total cleared area – riparian and upland.

(b) Total new impervious area.

(5) Site restoration. Photo or other documentation that site restoration performance standards were met.

b. Effectiveness monitoring. Gather any other data or analyses the BPA deems necessary or helpful to complete an assessment of habitat trends instream and riparian conditions as a result of this project. The BPA may use existing monitoring efforts for this purpose if those efforts can provide information specific to the objective of identifying habitat trends.

c. Lethal take. If a sick, injured, or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at 360.418.4246. The finder must take care in handling sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.

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[11] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

d. Report submission. Submit a copy of the report to the Oregon Office of NOAA Fisheries.

Oregon State Director
Habitat Conservation Division
National Marine Fisheries Service
Attn: **2003/00343 or 2003/01068**
525 NE Oregon Street
Portland, OR 97232

3. MAGNUSON-STEVENS ACT

3.1 Statutory Requirements

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan.

Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§ 305(b)(2)).
- NOAA Fisheries must provide conservation recommendations for any Federal or state action that may adversely affect EFH (§ 305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§ 305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA § 3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). "Adverse effect" means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g*., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NOAA Fisheries is required for any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action may adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects on EFH.

3.2 Identification of EFH

Pursuant to the MSA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Federally-managed Pacific salmon: Chinook; coho; and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

3.3 Proposed Actions

The proposed action and action area are detailed above in sections 1.2 and 1.3 of this document. The action area includes habitats that have been designated as EFH for various life-history stages of chinook salmon.

3.4 Effects of Proposed Action on EFH

The effects on chinook salmon are consistent with the effects for ESA-listed anadromous salmonids and are described in detail in section 2.2.1 of this document, the proposed action may result in short- and long-term adverse effects on a variety of habitat parameters. These adverse effects are:

1. Riparian disturbance from activities performed from the bank.

2. Increased sedimentation from instream construction activities.

3.5 Conclusion

NOAA Fisheries concludes that the proposed action will adversely affect designated EFH for chinook salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. NOAA Fisheries understands that the conservation measures described in the Biological Assessment will be implemented by the BPA, and believes that these measures are sufficient to minimize, to the maximum extent practicable, the following EFH effects: (1) Riparian disturbance; (2) increased sedimentation; and (3) improved habitat access. Although, these conservation measures are not sufficient to fully address the remaining adverse effects to EFH, specific terms and conditions outlined in section 2.7.3 are generally applicable to designated EFH for chinook salmon, and do address these adverse effects. Consequently, NOAA Fisheries recommends that the following terms and conditions be implemented as EFH conservation measures.

1. Term and Condition 1. (a., d., e., f., g., and h.) will minimize riparian disturbance from project implementation.

2. Term and Condition 1. (a., b., c., d., e., f., and g.) as well as, 2. (a., and b.) will minimize sedimentation and pollution of the Columbia River as a result of the project implementation.

3.7 Statutory Response Requirement

Pursuant to the MSA (§ 305(b)(4)(B)) and 50 CFR 600.920(j), Federal agencies are required to provide a detailed written response to NOAA Fisheries' EFH conservation recommendations within 30 days of receipt of these recommendations. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. In the case of a response that is inconsistent with the EFH conservation recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

3.8 Supplemental Consultation

The BPA must reinitiate EFH consultation with NOAA Fisheries if the proposed action is substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920(l)).

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